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EXAMINER

PALABRICA, RICARDO J

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/616,165

Applicant(s)

DASH, JOHN

Examiner

Harvey E. Behrend

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/20/64
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention i.e. failing to provide an enabling disclosure.

There is no reputable evidence of record to support any allegations or claims that the invention involves nuclear fusion nor, that any allegations or claims of "excess heat" are valid and reproducible, nor that the invention as disclosed is capable of operating as indicated and capable of providing a useful output.

The invention (see for example pages 1+ of the specification) is considered as being based on the "cold fusion" concept set forth by Fleischmann and Pons (hereinafter, F and P)(see the 3/24/89 article by D. Braaten). This concept relies on the incorporation of deuterium into a metal lattice. While F and P relied on electrolysis of heavy water to incorporate deuterium into the metal lattice, it was also known that as a variation, the deuterium could be incorporated into the metal lattice by bringing the metal into contact with deuterium gas.

Thus it is clear that applicants invention is just a variation of the cold fusion concept set forth by F and P.

However, as set forth more fully below, this "cold fusion" concept is still no more than just an unproven concept or theory.

Subsequent to the announcement of the cold fusion concept by F and P, many laboratories have attempted to confirm the results of F and P.

The results of these attempts at confirmation were primarily negative and even of the few initial positive results, these were generally either retracted or shown to be in error by subsequent experimenters (see for example, the article by Stipp in the Wall Street Journal and the article by Browne in The New York Times (particularly page A22)).

The general consensus by those skilled in the art and working at these various laboratories is that the assertions by F and P were based on experimental errors (e.g. see The New York Times article by Browne, Kreysa et al, Lewis et al, Hilts, Ohashi et al, Miskelly et al, and Chapline).

It was also the general consensus by those skilled in the art and working at these various laboratories that there is no reputable evidence to support the allegation or claim of excess heat production, nor, is there any reputable evidence of neutron, gamma ray, tritium, helium production, etc., to support the allegations or claims that nuclear reactions are taking place. See for example (in addition to the above listed references), Cooke, Alber et al, Faller et al, Cribier et al, Hajdas et al, Shani et al, Ziegler et al, Price et al, Schrieder et al and page A3 of the 3/29/90 edition of The Washington post (which refers to the negative

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findings of a physicist who had tested Pon's own cold fusion apparatus, for nuclear output (for a more complete analysis of said "negative findings", note the article by Salamon et al)). Also of interest in this respect is the Cooke reference which on pages 4 and 5 refers to the attempts at Harwell to obtain "cold fusion" and that Fleischmann (of F and P) had requested help from Harwell in verifying the cold fusion claims. Said page 5 also indicates that data was collected in Frascatti-type (i.e. gaseous) experiments.

The last paragraph on said page 5 states:

"After three months of around-the-clock work at a cost of over a half a million dollars, the project was terminated on June 15. This program is believed to be one of the most comprehensive worldwide with as many as 30 cells operating at a time and over 100 different experiments performed. The final result of this monumental effort in the words of the official press release was, "In none of these experiments was there any evidence of fusion taking place under electrochemical conditions. It should also be added that there was no evidence of excess heat generated by any of their cells".

Note that a disclosure in an application, to be complete, must contain such description and detail as to enable any person skilled in the art or science to which the invention pertains to make and use the invention as of its filing date, In re Glass, 181 USPQ 31. Applicants disclosure, however, does not contain the requisite description and detail.

There is no adequate description nor enabling disclosure of the parameters of a specific operative embodiment of the invention, including exact composition (including impurities and amounts thereof) of the electrolyte; composition (including impurities and amounts thereof), size, dimensions and porosity of the electrodes (as well as the spacing therebetween); the requisite

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concentration per unit volume of hydrogen isotopes in the cathode; the applied current and voltage; the requisite physical and/or chemical pretreatment of the electrodes; the instrument calibration prior to and during a run, test or experiment; the amount of each electrode to be immersed in the electrolyte; etc.

It is noted that the specification appears to set forth some of the parameters, however, the specification does not appear to set forth an example of an operative embodiment wherein specific values for each of the parameters are recited.

Note that such parameters are critical in arriving at an operative cold fusion embodiment. For example, Morrison (VI)(Cold Fusion Update No. 8) shows the electrode spacing to be an important parameter. Page 3 thereof, shows that if the electrodes are close enough to each other, one can get recombination of hydrogen isotopes and oxygen (which can be misinterpreted as excess heat). Jones et al (I), Murray (III), Wilson et al, Lewis et al, Shelton et al, Shanahan (IV) are example of documents showing the critical importance of proper instrument calibration and calorimetry analysis. Miles (C&EN, July 13, 1998 on pp 10, 11), Carr, Rolison et al, Green et al (particularly the second column on page 101), Williams et al, are examples showing the critical importance of cell component composition and impurity content and of electrode pretreatment.

The specification appears to refer to tests or experiments wherein heavy water cells produced "excess heat", tritium and other nuclear reaction products. However, these indications or allegations of the production of excess heat,

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tritium, and other nuclear reaction products, due to a nuclear reaction, are not sufficient to overcome the numerous teachings by skilled artisans, (set forth both above and below by the examiner) that the allegations of the obtainment of nuclear reactions, etc., in an electrochemical cell are not reproducible or even obtainable. Note that said "numerous teachings by skilled artisans" show that in this field, it is easy to obtain false indications of positive results.

It is not clear from the information set forth in the specification, that when all possible sources of error are taken into account, that applicant would still be able to show positive results or that the alleged positive results do not fall with the limits of experimental error. For example, the examiner has cited several documents that deal with calorimeter evidence of cold fusion and possible sources of error.

It is not seen wherein the specification discloses any particular structure, etc., which is unique to applicants' system and which makes applicants cold fusion system operative whereas the systems disclosed in the above referenced "numerous teachings by skilled artisans", were not operative.

As noted above, applicant is relying on an alleged showing of the production of tritium as evidence of nuclear fusion taking place in his system. However, the test data on page 5 of the specification is incomplete and inconclusive. For example, there is no indication of why one would obtain different counts from different samples from the same cell electrolyte. Further and even more importantly, no showing has been made that the increase in tritium does not arise from non-nuclear reactions such as the isotope separation

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factor of deuterium/tritium upon electrolysis or, that the alleged increase in tritium does not arise from scintillation-cocktail chemiluminescence of unneutralized basic solutions or, that the increase in tritium is not from tritium desorbed from tritium contaminated materials.

Note in this same respect that there are numerous documents of record showing that the alleged increase in tritium in the electrolyte, can not properly be relied on as evidence of nuclear reactions taking place (e.g. see page 528 of Lewis et al, pages 438, 448, 449 of Kreysa et al, Stipp, page 12 of Faller et al, Albagli et al (note page 137), Rogers et al (note the paragraph bridging pages 484, 485), Bosch et al (note page 182-184), and Henderson et al (note page 476)). Absent reputable evidence to the contrary, the showings in the above referenced documents are presumed correct and applicants results on page 5 of the specification are not proper evidence of nuclear reactions taking place. In further regard to the alleged production of nuclear reactions in applicants system, it is noted that applicant in a personal interview with the examiner on 11/22/94 in applicants prior application 07/996967 (see therein, Paper No. 15), stated that the cold fusion cell components being brought to the personal interview were not radioactive, and this is itself, evidence that nuclear reactions did not occur in his cold fusion experiments.

Note further in regard to this issue of alleged nuclear reactions, the statements near the top of page 7 of Morrison (VII) (Cold Fusion Update No. 9) re lab technicians, etc., not wearing film badges during cold fusion experiments in

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which nuclear reactions are alleged to take place (the film badges would give an indication of the amount of radiation received).

Applicant is also relying on the tests referred to in the specification, as providing evidence of the production of excess heat. Such however, is unpersuasive as there is no indication of what the experimental errors are. It is not clear from the information set forth in the specification, that when all possible sources of errors are taken into account, that applicant would still be able to show positive results or that the alleged positive results do not fall within the limits of experimental error.

Note that there will be a difference in heat between applicants H-cell and the D-cell, just because of the differences in the heats of absorption between the isotopes of hydrogen and deuterium (e.g. see Bosch et al in the last paragraph in the second column on page 166 and Table II and the first paragraph in the first column on page 167).

Applicants Example 2 on page 6 of the specification utilized identical cells except for the cathode (a platinum cathode for the control cell and a titanium cathode for the other cell) and, that the cell with the titanium cathode produced excess heat.

However, according to applicants own disclosure (see for example, the specification on page 1 lines 9+, 26+, page 3 line 1, claim 2) excess heat will also be produced utilized a platinum cathode.

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There is no adequate description nor enabling disclosure of how and in what manner, applicant is able to accomplish two separate contrary feats or features with the same identical inventive method and apparatus, i.e.:

(1) to utilize a platinum cathode in an excess heat and transmutation producing cell and,

(2) to utilize a platinum cathode in what applicant refers to and is art recognized as, a control cell.

There is also no adequate description nor enabling disclosure of how and in what manner, all three elements of palladium, platinum and titanium will function in applicants invention as nonhydride forming metals (e.g. note the specification on page 1 lines 9+ and 27+, the sentence bridging pages 2 and 3, claim 1).

It is noted that applicants disclosure (see for example, the specification on page 1 lines 22-25 and claims 1-8) that excess heat and tritium can allegedly be reproducibly produced by utilized an ionizable acid (sulfuric acid being merely recited as an example).

However, all of applicants examples utilize a specific amount of sulfuric acid and D₂O.

There is accordingly, no adequate description nor enabling disclosure of how and in what manner, one can reproducibly produce excess heat and tritium with any other relative amounts of sulfuric acid and D₂O, as well as any other ionizable acid (as recited in applicants specification and claims 1-8).

It would not appear that the type of acid utilized would have any effect on any possible nuclear reactions alleged to take place inside the cathode. Acids or bases are conventionally added to an electrolysis solution to make it more conductive when an electric current is applied to the anode and cathode.

Electrolysis is used as the means for charging (loading) the cathode with deuterium.

Clearly, the type of electrolyte utilized in the charging process (i.e. sulfuric acid, some other acid, a base such as an alkali hydroxide) can have no effect on the deuterium after it is inside the cathode and away from the electrolyte and thus it can have no effect on whether the charged or loaded cathode produces excess heat, tritium or transmutation products.

Note particularly in this respect that other artisans who also utilized electrochemical charging from a solution of sulfuric acid in heavy water, found no evidence of the production of excess heat or nuclear reaction products (e.g. note pages 1620, 1623 of Alessandrello et al; pages 381, 382 of Williams et al; pages 1127, 1128 of Astakhov et al; page 12 of Wilson et al; page 27 of NAWCWPNS TP 8302).

These statements in Alessandrello et al, Williams et al, NAWCWPNS TP 8302 and Wilson et al (particularly when combined with the above referenced statements in Silvera et al and Myers et al of no evidence of the production of heat or nuclear reaction products, even with D/Pd concentrations as high as 1.34 and 1.6 respectively), support the examiner's position that applicants evidence of

operability is based on experimental errors and/or misinterpretation of experimental results.

Note in this respect that there are numerous documents of record showing how errors can arise in the detection of heat (or a temperature rise) in these cold fusion systems and, that such errors can lead one to the erroneous conclusion that excess heat is being generated (and consequently, that nuclear fusion reactions are taking place).

Buehler et al note some of the problems and errors that can occur in calorimetry and, outlines some criteria for establishing calorimeter performance for definitive measurements of excess heat.

Clearly, when an artisan or experimenter is relying on the experimental results of particular tests or experiments to establish certain facts, i.e. the production of excess heat and nuclear reaction products, it is incumbent upon the experimenter to show that the alleged experimental results of excess heat are valid and not just the result of experimental errors or misinterpretation of experimental results (and that the alleged experimental results of excess heat do not fall within the limits of experimental errors).

This is especially so when the tests or experiments in question are (as here) in a field wherein the scientific community in general considers the alleged positive experimental results to be erroneous.

Note again in this respect that the examiner (as pointed out above), is relying on documents disclosing cold fusion experiments utilizing a sulfuric acid

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electrolyte, wherein no excess heat, no other nuclear reaction products, were produced.

Attention is again directed to the abstract and page 12 of Wilson et al.

Wilson et al found no evidence of excess heat or nuclear reaction products using a Pd cathode and a sulfuric acid electrolyte.

Alessandrello et al also obtained negative results using a Pd cathode in an electrolyte of D₂O and sulfuric acid or H₂O, D₂O and sulfuric acid (e.g. note pages 1617, 1620, 1623, 1633, 1634).

Astakhov et al found no evidence of neutron or gamma ray radiations during electrolysis of D₂SO₄ solutions in D₂O with a Pd cathode.

Williams et al (page 381) obtained negative results using an electrolyte solution of heavy water and sulfuric acid with a titanium cathode (it is considered well known in the cold fusion art that titanium is a conventionally known alternative to the use of palladium as the cathode, see also applicants specification on page 1 lines 22+ and claims 5 and 7).

This documentary evidence of Wilson et al, NAWCWPNS TP 8302, Alessandrello et al, Astakhov et al and Williams et al, show applicants alleged positive cold fusion results utilizing heavy water and sulfuric acid as not being reproducible.

It is noted that even applicants specification on page 1 lines 18+ indicates the alleged positive results of cold nuclear fusion or cold fusion transformations, are difficult to reproduce or duplicate!

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As to this issue of reproducibility, note the following comments by

Huizenga (IV) under the heading Reproducibility:

"The foundation of science requires experimental results to be reproducible. Validation is an integral part of the scientific process. Scientists are obligated to write articles in ways that allow observations to be replicated. Instructions should be available to permit a competent and well-equipped scientist to perform the experiment and obtain essentially the same results. Replication in science usually is reserved for experiments of special importance or experiments that conflict with an accepted body of work. The greater the implication of an experimental result, the more quickly it will be checked by other scientists.

As more and more groups at major universities and national laboratories were unable to replicate either the claimed excess heat or fusion products, proponents of cold fusion quickly pointed out that the experiment was not done properly: one needed different size palladium cathodes, longer electrolysis times, and higher currents, they claimed.

Whenever the inability of qualified scientists to repeat an experiment is met by ad hoc excuses, beware. One important role of a scientific article is to provide directions for others. Scientists establish priorities for their discoveries by publishing a clear and well documented recipe of their experimental procedures. If a scientific article fails to include an adequate recipe which allows a skilled reader to reproduce the experiment, it is a warning that the author's understanding of their work is incomplete.

Cold-fusion proponents introduced new dimensions into the subject of reproducibility in science. Some tried to turn the table on reproducibility by giving irreproducibility a degree of respectability. A second aberration was to assign a different value to experiments attempting replication. Only experiments that obtained some fragmentary evidence for cold fusion were to be taken seriously because it was declared that experiments obtaining negative results required no special skills or expertise. This viewpoint led proponents of cold fusion to invite mainly papers reporting positive results when organizing conferences. Such an aberrant procedure is incompatible with the scientific process and usually is viewed negatively by scientists as well as journalists" (Underlining added).

Note that "reproducibility" must go beyond one's own lab. One must produce a set of instructions, a recipe, that would enable anyone in their own independent lab (including the labs of cold fusion skeptics), to produce the same

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results. If reproducibility only occurs in one's own lab, errors (such as systematic errors) would be suspect. See for example, Little et al.

As a further issue in regard to reproducibility, experimenters who previously found evidence of excess heat, found no evidence of excess heat when better calorimeter equipment was used (see section 2.2 on page 2 of Morrison (IV) (note that such refers to the work at IMRA (Japan))).

Reproducibility of the alleged positive cold fusion results is clearly a critical feature in determining if a disclosure adequately teaches the artisan how to make and use an invention for its disclosed purpose.

Accordingly, the logical conclusion when one does not get identical results and/or the results are not reproducible at will in these cold fusion experiments, is that the alleged positive results are not real but instead, they are due to experimental errors, instrumentation errors, misinterpretation of results, etc.

Clearly, when an artisan or experimenter is relying on the experimental results of a particular experiment(s) to establish certain facts, it is incumbent upon the experimenter to show that the alleged experimental results are valid and not just the result of experimental error (and that the alleged experimental results do not fall within the limits of experimental errors).

This is especially so when the experiments in question are (as here) in a field wherein the scientific community in general considers the alleged positive experimental results to be erroneous.

It is considered elementary that identical structures operated in identical manners, must produce identical results. Such is even relied on in one's everyday life.

If instrumentation, etc., indicates that identical structures operated in identical manners do not produce identical results, clearly, one of two things is implied:

1) The presumed identical structures actually are not identical, i.e. one of said structures actually has something additional, some critical feature not found in the other said structure, which causes said one of said structures to produce the positive results.

2) The structures actually are identical, however, instrumentation, etc., is producing spurious results leading to the erroneous conclusion that one or even some of said identical structures, are producing positive results.

If however, it is actually something additional, some critical feature, which causes some of these cold fusion systems to produce actual, positive results whereas otherwise identical systems do not, then clearly, this something "additional", this critical feature, must be clearly specified so as to enable the artisan to make and use the invention as required by statute.

Accordingly, if applicants invention is actually able to reproducibility produce excess heat, tritium and transmutations, in contrast to the above referenced systems of Williams et al, NAWCWPNS TP 8302, Wilson et al, Alessandrello et al, and, Astakhov et al, it can only be because of said undisclosed, additional, critical feature(s).

Applicants specification is hence insufficient and non-enabling in failing to disclose said additional, critical feature(s) so as to enable anyone of ordinary skill in this art to make and use the invention in the manner disclosed and claimed.

Applicants specification (see for example page 1) postulates that the excess heat is the result of unknown nuclear reactions in the loaded (charged) cathode which yield tritium and energy (such is also evident from applicants Examples, wherein the control cell did not produce said tritium and energy.

However, there are numerous external influences that can effect the measurement of any produced heat. Applicants examples fail to set forth the error bars (and/or any cumulative errors) for the parameters utilized in the determination of the excess heat or energy. Note for example, the analysis of calorimetric evidence for electrochemical induced cold fusion in MisKelly et al, Albagi et al, Lewis et al, and Ohashi et al.

As indicated in the paragraph bridging pages 251, 252 of Huizenga (I), merely having different leads between the power supply and the control cell and the power supply and the cold fusion cell, can produce the appearance of positive results.

However, according to documents such as Silvera et al, no evidence of nuclear fusion reactions involving deuterium were found, even in D/Pd ratios as high as 1.34! Myers et al utilizing ion implantation obtained D/Pd concentrations as high as 1.6! However, even with this very high concentration of deuterium in the Pd lattice, Myers et al still found no evidence of nuclear reactions taking place!

As indicated by the first column on page 263 of Myers et al, the concentration of deuterium in the cathode that is obtainable by ion implantation, is much higher than what can be obtained by electrochemical charging (electrochemical charging being the manner utilized by applicant).

Even more critical, evidence that applicants invention is actually not operative to produce heat can be found in NAWCWPNS TP 8302 dated Sept. 1996, which on page 27 states that no excess heat was found in a system utilizing cold-rolled palladium sheet cathodes and procedures supplied by [applicant] Professor John Dash.

This is directly applicable against applicants claimed invention!

Applicants specification on page 1 line 26 refers to the use of an inert anode such as platinum and on page 2 lines 24+ to the use of inert containers which may take the form of glass beakers.

However, it is well known in the art that these materials (i.e. platinum and glass) are not actually inert (even in a solution of sulfuric acid and deuterated water) because the constituents thereof will dissolve or leach out into the electrolyte and plate out on the cathode.

This is one of the reasons why applicants disclosure is insufficient and non-enabling in failing to set forth the impurities (and amounts thereof) in the electrolysis cell components.

As indicated for example by page 1407 of Flanagan et al, the second column on page 144 of Albagli et al and, the second column on page 380 and the first column on page 382 of Williams et al, it is well known that elements or even

impurities in the cell container walls, etc., can leach out into the electrolyte and be deposited onto or in the cathode.

Note that page 1407 of Flanagan et al shows that even with a sulfuric acid electrolyte, elements or impurities from any of the electrolytic cell components can leach out into the electrolyte to be subsequently deposited onto the cathode.

As shown for example by Rolison et al, it is known that impurities such as Ag impurities in a Pd cathode will diffuse to the surface during electrochemical loading of hydrogen isotopes (e.g. note the abstract and the "Discussion" on page 1700, 1701). Page 59 of Pons et al shows that a Pd rod can contain both Au and Ag as impurities.

Since it is well known that metals such as platinum, gold and, palladium are generally found in the same ore, that they can be extracted sequentially, and that they will be contaminated by the other metals present, it is reasonable to assume that a Pt anode, would generally have the same type of impurities as the impurities present in a Pd rod (page 59 of Pons et al).

These impurities in the anode (such as the Au and Ag for example) would also dissolve in the electrolyte and be plated out on the cathode.

The presence of these impurities at the cathode could actually lead to the erroneous conclusion that transmutation has occurred (see in this respect, applicants specification on page 7 lines 28+ and page 8 lines 22+).

Applicants disclosure is insufficient and non-enabling as to whether the alleged transmutation is actually just impurities that have plated out on the

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cathode or diffused to the cathode surface or, a misinterpretation of experimental data.

For additional negative comments on the alleged transmutation of isotopes in a cold fusion cell, note pages 152-156, 237, 269, 275, 276, 284, 286 of Huizenga (I). Said pages 152-156 indicate that some experimenters at the Naval Research Laboratory had mistakenly reported the production of particular palladium isotopes by neutron transmutation in cold fusion cells using a technique known as SIMS (secondary ion mass spectroscopy). Said pages 153 to 156 set forth reasons for this misinterpretation of experimental data. Note said page 156 which states:

"The story associated with the palladium isotope anomaly is not nearly so interesting because it is was simply due to an erroneous interpretation of data where the experimental mass peaks were misidentified. Contributions from polyatomic species of impurities with masses nearly coincident with those of the palladium isotopes caused the misidentification.

In spite of the fact that the palladium isotope anomalies had been discredited for over five months, Bockris submitted a paper on March 26, 1990 [Fusion Technology 1811 (1990)] in which he discussed, along with other cold fusion phenomena, the thermal and 14-MeV-neutron-induced cross sections on palladium isotopes. He used these mistaken isotopic anomalies data to suggest that the cold fusion reaction is a surface or near-surface reaction, and, therefore, to serve as supporting evidence for his model of fusion. Among cold fusion enthusiasts mistakes and erroneous results usually decay with a very long lifetime". (Underlining added).

Clearly, when an artisan or experimenter is relying on the experimental results of particular experiments to establish certain facts, it is incumbent upon the experimenter to show that the alleged experimental results are valid and not just the result of experimental errors or misinterpretation of experimental results

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(and that the alleged experimental results do not fall within the limits of experimental errors).

There is thus no reputable evidence of record to support the assumption and speculation that useful amounts of excess heat, tritium, and other nuclear reaction products, etc., would be produced with applicants invention.

Also, there is thus no reputable evidence of record to support the assumption and speculation that the invention would actually operate as indicated.

Note further, that there are cold fusion experimenters (especially those who believe in cold fusion) who consider that it is the specific impurities and the level of these impurities, that cause some Pd cathodes to produce nuclear fusion while other Pd cathodes (even some from the same supplier and batch) do not cause nuclear fusion to take place.

Note for example, Murray (I) on page 1 quoting Edmund Storms that "...only certain samples out of the same batch of catalyst work. Presumably if the He concentration were uniform, all samples would show He production. On the other hand, failure to initiate a nuclear reaction could result from failure to remove all impurities from the surface in the failed runs. This purification process is known to be important and tricky."

See also the following statement by M. Miles on page 100 of the 7/13/98 issue of

C & EN:

"The cold fusion controversy will continue until an experiment is so clearly defined that it can be readily reproduced in any laboratory. My results, along with the reports from many other laboratories, suggest that there are hidden variables within the palladium metal that are not yet under experimental control. These variable include the grain size and impurity levels...." (Underlining added).

For further documents illustrating this problem of finding an appropriate or suitable Pd material, note Murray (III) and Carr.

The examiner has cited documents showing how easily, experimental data, experimental errors, etc., can be misinterpreted as providing evidence of the operability of such cold fusion systems. The scientific community in general does not consider such cold fusion systems real, valid or operative.

In this respect that there has essentially been a continuing stream of publications form 1989 on showing that virtually none of the scientific community consider the alleged positive results of these "cold fusion" experiments, as being confirmed. In this respect, attention is directed to Merriman et al, Ewing et al, Albagli et al, Bosch et al, Fleming et al, Balke et al, Henderson et al, Nova, Huizenga (I), Huizenga (II), Huizenga (III), Huizenga (IV), and Rogers et al.

These references provide further clear evidence that no excess heat is generated in such "cold fusion" systems nor is there any evidence of nuclear reactions or transformations taking place.

As to some of the Japanese claims of positive cold fusion results, note the comments by David Williams in the Hadfield article on page 10 of the 10/31/92 issue of New Scientist. David Williams (head of the department of chemistry at University College London) described the claims as "absolutely pie-in-the-sky".

Note also the negative comments in Huizenga (I) as to some of the Japanese work in cold fusion (e.g. see pages 240, 246, 251, 252, 277-281).

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Williams et al, Broad and NOVA refer to some of the spurious effects, faulty data, etc., which have led to some of the claims of the existence of cold fusion.

Clark et al (IV) show that metals can become contaminated with tritium from the atmosphere, that the amounts of absorbed tritium can be higher if the metals were close to releases of tritium by industry or by thermonuclear testing and, that such can lead to erroneous cold fusion results.

Fukai shows that deuterium nuclei in a palladium lattice cannot come close enough to each other to undergo nuclear fusion and, that the electrons do not provide an effective screening.

The Dagnai article in the 1/14/91 issue of C & EN states that the "cold fusion" claims are taken seriously by virtually none of the scientific community and that research at Utah's National Cold Fusion Institute (NCFI) as well as research elsewhere, have failed to establish the existence of cold fusion.

Another article by Dagnai (in the 6/14/93 issue of C & EN) entitled "Latest Cold Fusion Results Fail to Win over Skeptics", states that "the vast majority of scientists...dismissed the evidence of nuclear fusion results inside a metal lattice as nonsense-a case study in pathological science".

Note particularly the excerpts from the book "Too Hot To Handle" by Frank Close. This book refers to various errors in the work of F and P (e.g. see pages 161+), as well as by other experimenters (note particularly the comments on excess heat in calorimetry on pages 351-353).

In this same vein, note the analysis of calorimetry with electrolytic cells of the F and P type, set forth in Wilson et al, as well as the comments concerning possible errors in heat measurement by Jones (on pages 284, 285 of Surface and Coatings Technology) and, by Albagli et al.

Hilts states that the MIT experiments failed to produce any of the excess heat reported by the Utah group.

Lewis et al state in the summary on page 525 that they found no evidence of excess enthalpy in their experiments and, they refer to various possible sources of error which could lead to the erroneous conclusion that excess heat was produced (note pages 528-530).

Both Hilts and Lewis et al indicate that in any determination of excess heat, one must determine the total amount of energy produced (as heat and chemical energy) integrated over the whole period of cell operation, versus the total energy input.

Another document showing how experimental data, etc., can be misinterpreted as providing evidence of the operability of cold fusion systems, is the transcript of the television show on NOVA entitled, "Confusion in a Jar", which indicated that in these cold fusion experiments, it is fairly easy to get quick results which could be "interpreted" as providing evidence of "cold fusion" but that in very carefully run experiments which were rechecked, etc., such as by using several different methods and/or detectors to attempt to detect the same presumed experimental results, the end result was negative.

The article by Taubes on pages 1299-1304 of the 6/15/90 issue of Science, explains why the alleged detection of tritium at Texas A & M cannot be relied on as evidence of "cold fusion" actually taking place.

Note that evidence shows that even having a high concentration of deuterium in the cathode will not result in nuclear fusion taking place.

In this respect, Silvera et al found no evidence of "cold fusion" with a D/Pd ratio as high as 1.34 and, Myers et al obtained negative results even with a D/Pd ratio as high as 1.6.

Dagani in the June 5, 1995 issue of C & EN refers to experimental errors which negate the positive results of some cold fusion experimenters.

In a 1992 article in Surface and Coatings Technology, Jones takes the position that the claims of excess heat, tritium and helium production due to nuclear reactions are "dubious to say the least" (note page 288) because there is no evidence of commensurate nuclear products. Note the reference to $E=mc^2$ on page 286.

Taubes, "Bad Science: The Short Life and Weird Times of Cold Fusion", 1993, is a good reference for showing the view point of the scientific majority towards cold fusion. After interviewing 250 people in the field, Taubes concluded that "Cold Fusion... does not exist", and "As long as financial support could be found, the research would continue... In fact, the few researchers still working in the field would have little incentive to acknowledge negative results as valid, because such recognition would only cut off their funds". Note page 426.

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Another good reference presenting a compilation and analysis of cold fusion work subsequent to the 1989 announcement of the cold fusion claims of F and P, is the book, "Cold Fusion: The Scientific Fiasco of the Century", by

Huizenga (I). Huizenga was co-chairman of the DOE/ERAB panel on cold fusion. Note particularly the "Epilogue" on pages 237-287 which discusses some of the alleged positive results presented at the First, Second and Third Conferences on Cold Fusion.

On pages 201+ (and more particularly, page 214) Huizenga (I) indicates cold fusion can qualify or be characterized as "pathological science", defined as "the science of things that aren't so" (see also Huizenga (II), Huizenga (IV), Morrison (II), and Rousseau in this respect).

On page 206, Huizenga (I) states that some of the similarities between cold fusion and other unsubstantiated concepts, are

- (1) lack of control experiments,
- (2) statistical uncertainties,
- (3) irreproducibility and
- (4) the public description as a "simple experiment".

Note particularly pages 125, 222, 223, of Huizenga (I) which refer to the lack of reproducibility of the alleged "positive" cold fusion results.

Clearly, if something cannot reproduced at will, there is also, then, no enabling disclosure which would enable one of ordinary skill in the art, to make and use it, as required by statute (35 USC 112).

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Morrison (I) in Trans. Of Fusion Technology, sets forth various criteria to be followed in doing cold fusion experiments and of problems that can arise.

Jones et al (II) and Jones et al (I) debunk the positive cold fusion claims of Miles et al at the Naval Research Lab in China Lake, showing how experimental errors, etc., can give a false impression of positive results.

Jones et al (III) and Shkedi et al show how faradaic efficiencies of less than 100% during electrolysis of water can account for alleged reports of excess heat in "cold fusion" cells.

For a good discussion of errors arising in cold fusion tests or experiments, note for example, the book, "Too Hot To Handle", by Frank Close, Page 259-263 of this book set forth various errors that can occur, leading to the erroneous conclusion that excess power was produced in the cold fusion experiments.

Page 261 of this book contains the telling statement:

"In addition to these experimental problems there were several examples where the numeral evaluation of the data and assessment of error were incorrectly or badly done or, in some cases, not done at all...

The DOE panel commented that there had been a noticeable lack of attention to the statistical assessment of errors, and that in some cases, where heat was being claimed, a group's claim of excess heat is not supported with results of sufficient precision to allow such a conclusion. More usually it is not possible to asses precision form reported results because the result is reported from a single run and no error bars are provided for the measured parameters....

The DOE panel noted: 'Conclusions in this area simply cannot be accepted without a through assessment of the measurement errors. In its visits and conversations the members of the panel were struck repeatedly by the absence of critical assessments of this kind.'" (Underlining added).

In this respect, Morrison (III), Jones et al (I), Murray (II), Murray (VI), Jones et al (II), Jones et al (III), Green et al, Shelton et al, and Merriman et al,

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discuss some of the possible sources of errors (including systematic errors) in the calorimetry that can lead to the erroneous conclusion that excess heat was present. As indicated above, Buehler et al set forth criteria useful for establishing calorimeter performance for measurements of excess heat. Murray (VII) lists several questions to be addressed in cold fusion calorimetry so as to provide more accurate results. Murray (VI) states subtle systematic errors cannot be found by analyzing the final report of an experiment, since by that time any inconsistencies that might have pointed to such an error have been smoothed over and cultivated out of the data and the only way to find such errors is to immerse yourself in the laboratory with the working experiment and just go over everything countless times.

As to further documents illustrating errors that can occur and/or have not been accounted for in cold fusion experiments, see J.E. Jones, Giglio, Shanahan (II), Shanahan (III), Schultz (I), Schultz (II), Blue, Carr, Hoffman, Shkedi et al, Shelton et al, Jones et al (III).

It is the examiners' position that an undue amount of experimentation would be required to produce an operative embodiment of applicants invention. The examiner has cited numerous documents showing that experimenters have obtained negative results using various types of cold fusion apparatus, all based on the cold fusion concept set forth by F and P. These documents show how easily experimental results can be misinterpreted as evidence of cold nuclear fusion.

This issue of undue experimentation has been succinctly addressed by Douglass Morrison at the Fourth International Conference on Cold Fusion Technology, (ICCF-4) held Dec. 6-9, 1993 in Hawaii (reproduced in Transactions of Fusion Technology vol. 26, Dec. 1994), see page 54 which states:

IX. When A COLD FUSION WORKING DEVICE?

8 December 1993; the previous speaker, Dr. H. Fox, giving he said, a businessman's point of view, declared he expected a working Cold Fusion device in 20 years.

November 1993. Dr. S. Pons said that by the year 2000 there should be a household power plant -6 years.

1992. Dr. M. Fleischmann said a 10 to 20 Kilowatt power plant should be operational in one year.

July 1989, The Desert News published an article by JoAnn Jacobsen-Wells who interviewed Dr. S. Pons. There is photograph in color, of Dr. Pons beside a simple apparatus with two tubes, one for cold water in and one for hot water out. This working unit based on Cold Fusion was described as "It couldn't take care of the family's electrical needs, but it certainly could provide them with hot water year-round" said Pons".

Later in the article it was written "Simply put, in its current state, it could provide boiling water for a cup of tea."

Time delay to this working model – Zero years.

Thus it appears that as time passes, the delay to realization of a working model increases.

X. CONCLUSION

No conclusions are presented – everyone can judge for themselves. However some questions can be asked;

Are Cold Fusion results consistent in claiming Cold Fusion effects in Deuterium but not in normal Hydrogen, while other groups claim Cold Fusion effects with hydrogen?

Is the ratio of tritium to neutron production about unity as Fleischmann and Pons originally claimed [5] or is the ratio in the wide range $10^4 - 10^9$ as most other workers claim?

Are transmutation, Black Holes, Biology [18] part of the normal world of Cold Fusion?

To explain the null experiments there is one theory – the conventional theory of Quantum Mechanics, but that are a wide variety of theories to explain positive Cold Fusion results – can they all be valid simultaneously – if not, which should be rejected?" (Underlining added).

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Murray (IV) (particularly pages 5 and 6) show how ICP-MS data can be misinterpreted as providing evidence of nuclear transmutations or transformation.

Note also in this respect, the negative comments concerning nuclear transmutations in cold fusion cells, on pages 7 and 8 of Morrison (IV).

Note the statements (reproduced below) concerning nuclear transmutation on page 1 of Segment 2 of Bass.

"Scott's second epistle recapitulates what we learned from realms of data from Miley's and the Cincinnati Group's transmutation data. No reasonable evidence for transmutation exists once allowance is made for the innumerable ways complicated and subtle instrumentation can be wrong. You see, we can't even determine with those remarkable systems something as simple as 10 ppm Zn in pure Li_2SO_4 . Prejudiced and desperate attempts to quickly survey complex unknown samples results in "data stew". (Underlining added).

Note also that page 2 of Segment I of Bass indicates that errors can easily occur in ICP/MS when working on unknown and/or unusual samples. Said page 2 states that different labs using samples split from the same reagent grade Li_2SO_4 came up with differing amounts of Zn as being present in Li_2SO_4 . See the fifth paragraph on page 2 which states:

"The Aldrich lot analysis showed 4 ppm Zn. The old lab got 9 ppm Zn. The new lab got 51 ppm Zn. I told the new lab what the other two results were and asked them to repeat their analysis, they managed to come up with 31 ppm Zn the second time".

Morrison (V) provides a good report on the 5th Cold Fusion Conference and Morrison (IV) (discussed above) provides a good report on the Sixth Cold Fusion Conference.

Note also the negative comments concerning "cold fusion" in Hoffman.

For a good up to date overall analysis of the status of Cold Fusion/Low Energy Nuclear Transmutations (CF/LENT), attention is directed to the MEMO (dated 10/9/97) from Bennett Miller to Dr. Robert W. Bass.

The Miller Memo indicates Dr. Bass had requested the Department of Energy to do a new, full-scale review of the Cold Fusion/Low Energy Nuclear Transmutations (CF/LENT) phenomena because of what Dr. Bass considered to be "emerging evidence of progress".

The Miller Memo indicates DOE's response was to commission Mr. Miller to do the review.

Page 3 of the Miller Memo indicates the vast amount of documents, etc., reviewed and considered by Miller in arriving at his conclusions.

Basically, the conclusion of the Miller Memo is that there is still no concrete evidence of excess heat, nuclear transmutations, etc. Note particularly the following excerpts from the Miller Memo:

"The core problem that I have with CF/LENT is the disconnect between the public pronouncements of its proponents regarding the imminent commercial availability (nay, already established commercial availability if I am to believe the press clippings) of such systems and the somewhat more private and negative developments that seem to emerge at every turn.

Most prominent, but still only three among many such examples of the former, are first, the Cincinnati Group's recent representations regarding a revolutionary approach to the nuclear waste remediation problem -- representations that you openly endorsed as revealed truth; second CETI's equally bold guarantee of a CF cell that put out aneutronic, excess heat on a reliable, predictable basis. And, third, your vouching to me, some time ago, for the imminent commercial installation operation of a CF power system in a hotel/resort complex that is currently under construction.

Moreover, the casual reader, picking up an issue of Infinite Energy, for example, would be hard pressed not to conclude that CF/LENT is a

closed matter as far as demonstrating scientific feasibility is concerned. Around the world, governments and industries are successfully demonstrating the phenomena of excess heat, at the very least. If so, no further development, let alone research, is needed or desired. What possible role should or could your government's federal research and development community play when its charter is to support primarily that work that the private sector cannot or will not do on its own?

At the same time of course, more careful attention to what is going on suggests that not all is what it seems to be. The CG approach to nuclear transmutation is at best mired in controversy of the most basic sort. There is no verification of initial claims. There is no explanation of the basic process. A recent attempt to verify the process by a third party in one of DOE's national laboratories, was, in everyone's opinion, a failure; though it can be argued that the tests were inconclusive for a number of reasons. The CETI cell has similar problems. The hotel project with the 500 kw CF power plant, about which you were so enthusiastic, has been delayed indefinitely. And, the Japanese have terminated their three-year million dollar effort to demonstrate and commercialize cold fusion.

Perhaps this evidence that all is not well can be explained by sloppy science, or just complicated science, or financial difficulties unrelated to science, or by government mismanagement, or by pressure to move in different directions, though in the case of Japan that is hard to believe. Your assertion that the Japanese government has applied pressure internally to disband the effort flies in the face of all logic.

If any nation accords energy matters a higher priority than the Japanese, I do not know of it. If cold fusion is real, demonstrable, and reproducible it would mean more to the Japanese than any other industrialized nation. It would be a harbinger of the ultimate energy security that they have been seeking for the past 70 years-a security of energy supply that was one, if not the most, important determinant of their willingness to go to war in 1941. What possible motive could be to disbanding an effort that advocates of CF/LENT expected to succeed, except that perhaps it was not?

In fact it is my current understanding that the NHE program was disbanded precisely because it could not meet its primary objective of a concrete demonstration of excess heat, even after three years of work and an expenditure of over \$30 million. There have been claims made that the efforts was poorly managed – that emphasis was incorrectly given to building a precommercial infrastructure at the expense of doing the science that needed to be done. If so, that is truly a sad state of affairs. But if it is true, I believe it will be corrected in fairly short order if for no other reason than that the stakes are so large. Nonetheless, the effort by a major industrial nation to amount a successful, ministry-sponsored, CF program cannot be characterized as anything other than a failure at this point.

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This line of inquiry bring us back to the fundamental dilemma. If CF/LENT is as real as some of the scientific results presented at respected scientific meetings (or as real as its press clippings), then it is already well beyond the stage where federal tax dollars are needed. It is a commercial reality, or co close that the private sector should be jumping at the business opportunity of a lifetime – the opportunity to capitalize on a discovery of momentous proportions that is relatively uncluttered by government claims to prior knowledge or prior invention.

If on the other hand, CF/LENT is still in that nascent stage where nothing is really clear and where the prospect still exists that all is artifact and anecdote, then there is only one prudent course for practioners to follow -- go back to basics and systematically subject the phenomena to careful examination by the time-tested process of merit-based, peer-review.

I believe, as I have already stated, that I think there are good things to be done in this arena. New ground to be broken. New discoveries to be made. New industries created. But only after the basic science has been illuminated and accepted by the scientific community at large. That is how we, as a nation, have built the greatest scientific establishment in the world. I urge you and your colleagues to accept the challenge. Come forward. Present proposals. Abide by the process.

It will not be easy. Nor will it be guaranteed of success."

Note that Blue (like the Miller Memo above), also refers to Japan as dropping the funding for cold fusion research.

As to some specific artisans in the cold fusion field, note that Jones (Surface and Coatings Technology – 1992), Jones et al (I) (J. Phys. Chem; - 1995), Jones et al (III) (J. Phys. Chem. B, 1998), Droege (Maui Papers #4), show that the alleged positive results of Dr. Miles cannot be relied on as accurate.

Even Miles himself in an article entitled "Cold Fusion Controversy" on pages 10, 11 of C & EN (July 13, 1998) states:

"The cold fusion controversy will continue until an experiment is so clearly defined that it can be readily reproduced in any laboratory. My results, along with the reports from many other laboratories, suggest that there are hidden variables within the palladium metal that are not yet under experimental control. These variables include the grain size and impurity levels."

Little (21 May 1998), found no evidence of excess heat when attempting to duplicate the alleged positive results of Dr. Case, even with input from Dr. Case. Clarke (II) (Jan. 2003) also found no evidence of He-4 production from DD fusion in Case-type cells. On page 127, Clarke (II) states that on the evidence, systematic error is the likely reason for the alleged observation of He-4 production by Dr. Case and by McKubre et al at SRI. Clarke et al (III) on page 254 state this systematic error may be due to SRI calibrating their mass spectrometer with deuterium gas having approximately 5ppm He-4.

There have been allegations of excess heat in "boil dry" experiments.

However, the alleged showings of excess heat such as in "boil dry" or "heat alter death" experiments such as that of F and P, are of no merit in view of the showings for example, in any of Morrison (III) (Physics Letters A), Morrison (VI) (Cold Fusion Update No. 8), Morrison (VII) (Cold Fusion Update No. 9), Droege (Maui Paper #4), White, Wilson et al.

As to Dr. Arata's alleged positive results, note for example, the negative comments in Murray (VII), Shanahan (I), Shanahan (II), Clarke (I), Clarke et al (I), Clarke (III) and Clarke et al (II). In the second column on page 152, Clarke (III) concludes that Arata et al actually recorded the well-known (to mass spectroscopists) instrumental "memory effect" for He-4 and mistakenly labeled it as a genuine signal of that isotope in the Pd-black samples. Clarke (III) states that in this type of "memory", a D_2^+ ion beam is much more effective in releasing imbedded He-4 (from previous samples) from interior sections of the mass

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spectrometer than an H_2^+ ion beam. Clarke et al (I) end with the telling statement, "To be sure, it is very attractive to consider the prospect of energy produced be "cold fusion"; however, we are not willing to suspend the laws of nature (as the ancient Greeks said it) in order to "save the phenomenon"."

As to Dr. McKubre's alleged positive results, note for example, the negative comments in Shelton et al, Green et al, Shkedi et al, Giglio, Murray (II), Murray (V), Shanahan (III).

Note particularly, the following quote from McKubre in Murray (II):

"We do not know how to reproduce our own experiments. We have generated more null results and hours of beautiful calorimetric balance (>100, 000h) than anyone on the planet except Fleischmann and Pons. Nevertheless, the existence of a thermal anomaly in the D/Pd system is clear to me, as it is to them because we have seen the effect with our own eyes and modulated it with our own hands. We cannot prove it to you because we are not in control of all critical parameters. You should be skeptical, and remain so until we supply proof". (Underlining added).

Shanahan (III) (dated 2003) refers to problems with the helium measurements by McKubre at SRI, (said problems including significant contamination due to leakage to air). The problems with leakage to air at SRI, are discussed in detail in Clarke et al (III). Giglio shows that if McKubre is actually producing helium, he should also be detecting gamma radiation and, shows that the energy from the alleged nuclear fusion reactions cannot be transferred to the cathode crystal lattice as speculated by some cold fusion advocates.

Shanahan (IV) (Themochimica Acta (2002)) refers to a systematic error in mass flow calorimetry that can account for the alleged excess power (heat)

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results in cold fusion experiments. Shanahan (V) (dated 2002) states that the recent Navy report also did not consider this systematic error and so, does not eliminate it as a possible explanation. In this same vein, Shanahan (VI) discusses a report by Szpak, Mosier-Boss, Miles and Fleischmann in which they attempt to reject recombination as the actual cause of their alleged excess heat observations. Shanahan (VI) states that Szpak et al have misunderstood the at-the-electrode, under the electrolyte surface recombination issue and that their prior photographic evidence is in fact, reasonable evidence of this recombination phenomenon. Shanahan (VI) sets forth physical conditions which could produce a calibration constant shift and what might cause those conditions to arise. Note particularly, the "Conclusions" in Shanahan (VI).

The documents relied on above by the examiner, are evidence that one of ordinary skill in this art does not know the parameters of an operative cold nuclear fusion/cold nuclear transformation system which is actually capable of producing nuclear reactions or excess heat, nor, how to determine these requisite parameters and, do not consider such cold nuclear reaction systems to be operative.

This being the case, it is necessary for applicants specification to disclose the requisite parameters for obtaining the particular disclosed and claimed nuclear reactions, nuclear transformations, and/or heat energy, when utilizing applicants particular cold nuclear reaction system.

However, applicants specification is insufficient and non-enabling in failing to set forth said requisite parameters.

In the present case, the examiner has stated above that there is no adequate description nor enabling disclosure of said requisite parameters.

Note again that the examiner has presented extensive documentary evidence that those of ordinary skill in this art do not know what specific parameters, are actually necessary to cause the production of nuclear reactions or excess heat in this type of system. See Bank v. Rauland Corp. 64 USPQ 93; In re Corneil et al, 145 USPQ 697.

Note further that said extensive documentary evidence shows that the scientific community in general considers the alleged positive cold nuclear reaction results to be no more than the result of experimental errors or misinterpretation of experimental data, and not-reproducible.

Again, as set forth above, "reproducibility" must go beyond one's own lab. One must produce a set of instructions, a recipe, that would enable any one in their own independent lab, to produce the same results. If reproducibility only occurs in one's own lab, errors (such as systematic errors or misinterpretation of experimental data) would be suspect.

The present case is considered analogous to that in In re Chilowsky, 134 USPQ 515, wherein the Court held the disclosure to be insufficient. In the present case, the examiner has shown that various necessary parameters have not been provided and, the examiner has provided evidence that the artisan does not know the requisite parameters of an operative cold fusion system, nor how to make an operative cold fusion system.

Note in this respect the Court's statement on page 519 of In re Chilowsky:

"Chilowsky could not start to describe his invention with the assumption that those skilled in the art knew in detail how to build his nuclear reactor. Since it was a major part of what he purported to have invented, it is incumbent on him, under section 112, to tell how to build it, under principles of patent law too elementary to require discussion".

It is apparent from the specification that applicants concept or theory of obtaining an operative cold fusion system, is actually based on the "cold fusion/nuclear reaction" systems that came about from the work of F and P, and it is workable or operative, only if these systems are already operative.

However, as set forth above, the examiner has presented evidence showing that in such cold fusion systems, the claims of nuclear reactions or excess heat (as well as of other nuclear reaction products), are not reproducible or even obtainable. It consequently must follow that the claims of nuclear reactions or excess heat are not reproducible or even obtainable with applicants invention. While applicant may have set forth theoretical concepts, it is well known in the cold fusion/nuclear reaction field that theory and reality have a habit of not coinciding. There is no evidence to indicate applicant has so succeeded where others have failed, in arriving at an operative cold nuclear reaction system, i.e. that he has progressed his system beyond the point of an unproven theory or concept which still requires an undue amount of experimentation to enable the artisan to make and use the inventive system for its indicated purpose. This view is also considered supported by the failure to set forth a full example of the specific parameters of an operative embodiment. One cannot rely on the skill in the art for the selection of the proper quantitative values to present an operative cold fusion system, since those in the art do not know what these values would

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be. See Bank v. Rauland Corp., 64 U.S.P.Q 93; In re Corneil et al, 145 U.S.Q. 697.

It is thus considered that the examiner (for the reasons set forth above) has set forth a reasonable and sufficient basis for challenging the adequacy of the disclosure. The statute requires the application itself to inform, not to direct others to find out for themselves; In re Gardener et al, 166 USPQ 138, In re Scarbrough, 182 USPQ 298. Note that the disclosure must enable a person skilled in the art, to practice the invention without having to design structure, not shown to be readily available in the art; In re Hirsch, 131 USPQ 198.

To comply with the enablement requirement of the first paragraph of 35 USC 112, a disclosure must adequately present the claimed invention so that an artisan could practice it without undue experimentation. In determining whether any given disclosure would require undue experimentation to make and use the claimed subject matter, consideration must be given to such factors as the relative skill of those in the art, the state of the prior art, the nature of the invention, the presence or absence of a working example, the amount of direction or guidance presented, the predictability or unpredictability of the art, and the quantity of experimentation necessary. Ex parte Forman 230 USPQ 546, 547.

Additionally, it is noted that there has been a published Board decision involving "cold fusion":

See Ex parte Dash, 27 USPQ2d 1481, wherein it was held that the examiner did not err in rejecting claims for "cold fusion" of nuclear energy for lack of enablement under 35 U.S.C. 112 and as inoperative and

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lacking utility under 35 U.S. C. 101, since evidence demonstrating that neither excess heat nor traditional nuclear by products of fusion reaction have been detected by careful researchers conducting experiments under conditions that are highly analogous to applicant's electrolytic cell, and demonstrating relative ease with which erroneous results can be achieved by failing to observe strict experiment design controls shifted burden of proof to applicants, and applicants failed to produce any evidence to overcome examiner's position.

There has also been a decision by the U.S. Court of Appeals Federal Circuit on an application involving "cold fusion".

See In re Swartz, 56 USPQ2d 1703 wherein it was held:

Claims in application that fail to meet utility requirement because invention is inoperative will also fail to meet enablement requirement because person skilled in art cannot practice invention, since application, in order to satisfy enablement of 35 U.S.C §112, must adequately disclose claimed invention so as to enable person skilled in art to practice invention at time of filing without undue experimentation, and since utility requirement of § 101 mandates that invention be operable to achieve useful results.

U.S. Patent and Trademark Office properly rejected application claims directed to "cold fusion" process for lack of utility and enablement, since PTO provided substantial evidence that those skilled in art would reasonably doubt asserted utility of claimed invention, and found that applicant had not submitted evidence that concept of invention could have been practiced by person of ordinary skill without undue experimentation, and since applicant's conclusory allegations that PTO's decision on utility issue is not supported by substantial evidence, or that its conclusion of lack of enablement is incorrect as matter of law.

It is also noted that there has apparently been a court decision on cold fusion in Italy (e.g. see Italy-Cold Fusion & Judges's Verdict).

3. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, for the reasons set forth in the objection to the specification, in section 2 above.

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-8 are rejected under 35 U.S.C. 101 because the invention as disclosed is inoperative and therefore lacks utility.

~~The reasons that the invention as disclosed is operative are the same as~~
the reasons set forth in section 2 above as to why the specification is objected to
and the reasons set forth in said section 2 above are accordingly incorporated
herein.

Applicants claimed invention is directed to a method of producing heat energy. The only reference in applicants specification to the production of "heat energy", is in reference to heat from a "nuclear reaction" taking place in a deuterium loaded cathode or to the production of "excess heat" (e.g. see pages 1 and 8). Note that the term "excess heat" is a conventional term used in this art in referring to the heat produced from a cold fusion nuclear reaction.

Thus, this production of "excess heat" or heat from a nuclear reaction, is considered as being applicants specific utility.

The statute requires that an asserted utility be specific, not general. Note MPEP 2107.01 (II)A which states:

"A statement of specific utility should fully and clearly explain why the applicant believes the invention is useful. Such statements will usually explain the purpose of or how the invention may be used (e.g., a compound is believed to be useful in the treatment of a particular disorder). Regardless of the form of statement of specific utility, it must enable one ordinarily skilled in the art to understand why the applicant believe the claimed invention is useful."

As set forth in MPEP 2107 (IV) a deficiency under 35 USC 101 also creates a deficiency under 35USC 112 first paragraph, citing In re Brang, 34 USPQ2d 1436.

As set forth in section 2 above, there is no reputable evidence of record to indicate the invention has been reduced to the point of providing in current available form, an operative cold fusion system. The invention is not considered as meeting the requirements of 35 U.S.C. 101 as being "useful". Note in this respect, page 89 of Huizenga (I). Said page 89 reproduces the conclusion of the final report of the DOE/ERAB panel on cold fusion. Conclusion (I) states that there is no "convincing evidence that useful sources of energy will result from the phenomena attributed to cold fusion".

Applicant at best, has set forth what may be considered a concept or an object of scientific research. However, it has been held that such does not present a utility within the meaning of 35 U.S.C. 101. See Brenner v. Manson, 148 U.S.P.Q. 689.

Additionally, it is well established that where as here, the utility of the claimed invention is based upon allegations that border on the incredible or allegations that would not be readily accepted by a substantial portion of the scientific community (note the documents relied on by the examiner in section 2 above), sufficient substantiating evidence of operability must be submitted by applicant. Note In re Houghton, 167 USPQ 687 (CCPA 1970); In re Ferens, 163 USPQ 609 (CCPA 1969); Puharich v. Brenner, 162 USPQ 136 (CADA 1969); In re Pottier, 152 USPQ 407 (CCPA 1967); In re Ruskin, 148 USPQ 221 (CCPA

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1996); In re Citron, 139 USPQ 516 (CCPA 1963); and In re Novak, 134 USPQ 335 (CCPA 1962).

6. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, because the best mode contemplated by the inventors has not been disclosed.

The specification sets forth the positive results of cold fusion tests or experiments. Since the specification set forth specific energy outputs, etc., for the tests or experiments, thus indicating that actual cold fusion cells or apparatuses were constructed and operated, the logical conclusion is that applicant was aware of all of the system parameters needed to give the indicated positive results but, failed to disclose such, said system parameters including the applied current and voltage, the time period in which the current is applied, the isotopic composition (including impurities and, amounts thereof) of the electrode and of the electrolyte, the dimensions of the electrodes, the type of anode used and the electrode spacing, the specific physical and/or chemical pretreatment of the electrodes, the instrument calibration prior to and during each test or experiment, the requisite portions of the electrodes immersed in the electrolyte, etc.

Note in this respect, that applicants drawings show the electrolyte as only partially covering the electrodes (24, 26) and (20, 22), thus, even giving the electrode size would not indicate the portion of said electrode in contact with the electrolyte.

Even applicants claims utilize this language of the electrolyte as partially covering the cathode and an anode.

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As further evidence that applicant has failed to disclose all of the requisite parameters utilized in his tests or experiments to obtain excess heat as set forth in the Examples in the specification, attention is directed to the statements by Dr.

Miles on page 27 of NAWCWPNS TP 8302.

Dr. Miles (who, according to the abstract on the "Report Documentation Page", can presumably be considered a cold fusion advocate or believer) found no evidence for excess heat with an electrolyte of sulfuric acid in D₂O and cold-rolled palladium sheet cathodes and procedures supplied by Professor John Dash (the applicant of the present case).

As noted by Dr. Miles on said page 27, Dr. Dash claimed a reproducible excess heat effect with his method, however, Dr. Miles on said page 27 states that no excess heat was measured.

Thus, if the applicant was actually able to obtain the excess heat with his invention as set forth in the Examples in the specification, while Dr. Miles couldn't, it can only be because the applicant has failed to disclose all of the requisite system parameters utilized in obtaining the excess heat results referred to in the specification.

As indicated in MPEP 2165 and Union Carbide Corp. v. Borg-Warner, 193

USPQ 1:

"Failure to disclose the best mode need not rise to the level of active concealment or grossly inequitable conduct in order to support a rejection or invalidate a patent. Where an inventor knows of a specific material that will make possible the successful reproduction of the effects claimed by the patent, but does not disclose it, speaking instead in terms of broad categories, the best mode requirement has not been satisfied" See also, Spectra-Physics v. Coherent, 3 USPQ 2d 1737.

7. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are vague, indefinite and incomplete.

As set forth in section 2 above, the examiner has cited documents (e.g. Alessandrillo et al, Williams et al, Wilson et al, NAWCWPNS TP 8302, and Astakhov et al) all of which illustrate cells identical to what applicant has disclosed and claimed, but, which did not obtain the excess heat, tritium and transmutation products which applicant obtained.

Accordingly, applicants claims are incomplete in failing to recite the apparently critical additional features/parameters, etc., not found in said documents, which actually enables applicants claimed invention to produce the indicated excess heat, tritium and transmutation products.

Included in said apparently critical additional features/parameters, are the requisite "sufficient" amount of electrolyte and the degree to which each electrode is "partially" immersed in the electrolyte.

Note that terms such as "sufficient", "at least partially", etc., are relative, they can be given no definite meaning, they have not been defined in the specification and accordingly they render the claims vague and indefinite and the metes and bounds thereof are undefined.

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Claim 6 is vague, indefinite and incomplete as to the pertinence of the size of the cathode without knowing how much of the cathode is immersed in the electrolyte.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5, 7, 8 are rejected under 35 U.S.C. 102(a, b, g) as being clearly anticipated by Pons et al (WO 90/10935).

Note the dates on the priority data documents of Pons et al, all of which refer to work done in this country. The mere fact that Pons et al was published shows it was not abandoned, suppressed or concealed.

The paragraph bridging pages 19 and 20 of Pons et al refers to an electrolyte of deuterated water and sulfuric acid. Page 21 refers to cathode shapes. Note the cell parameters on pages 49, 66, 68, 70 of Pons et al.

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10. Claims 1-5, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pons et al in view of either Decrosta or Pryor et al.

Pons et al have been discussed above.

While Pons et al may not specifically recite the amount of sulfuric acid to be utilized in the D₂O, it is already old and advantageous in this art to utilize an aqueous electrolyte composition wherein the sulfuric is about 15% by volume as evidenced for example by the teachings thereof in either Decrosta or Pryor et al.

Accordingly, it would have been prima facie obvious to have modified Pons et al by having the sulfuric acid be about 15% by volume of the D₂O because such is a conventionally known and advantageous electrolyte composition as shown by the teachings thereof in either Decrosta or Pryor et al.

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pons et al in view of any of Storms et al, Bertalot et al or Williams et al.

Pons et al have been discussed above. While page 21 of Pons et al refers to different suitable cathode shapes, including in rolled or planar sheet or the like form, it does not set forth the size thereof in terms of area.

Storms et al, Bertalot et al and Williams et al, each show an electrolytic system similar to that of Pons et al and show the cathode can advantageously be in sheet or strip form and have a size or area of about 1 cm² (e.g. see the tables on pages 159+ of Storms et al, the last full paragraph on page 366 of Bertalot et al, and, Table 2 on page 381 of Williams et al) and, to have utilized such cathode sizes (areas) in Pons et al would accordingly have been prima facie obvious.

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12. Claims 1-9 are rejected under 35 U.S.C. 103 as being unpatentable over either Fleischmann et al or Pavelle et al, in view of any of von Sturm, Spengler et al, Fedorova et al, Flanagan et al or Krause et al.

The primary references each show an electrolysis system and method substantially as claimed except that the electrolyte is an alkali water solution rather than a sulfuric acid water solution.

However, it is conventionally known in water electrolysis systems that the electrolyte solution can be either alkali or acidic (such as by using sulfuric acid). As evidence that these two solutions are known alternatives, resort may be had to the teachings thereof in any of von Sturm (note col. 2 lines 63+), Spengler et al (note col. 2 lines 53+), Flanagan et al (page 1400), Krause et al (page 466) or Fedorova et al (page 325).

Note initially that all references are to electrolysis systems wherein hydrogen and oxygen are generated by electrolytic action. The secondary references each clearly show that in such electrolysis systems, an acidic electrolyte is a conventionally known alternative to an alkali electrolyte.

Accordingly, it would have been prima facie obvious to have utilized a sulfuric acid solution rather than an alkali solution in either primary reference, in view of the above referenced teachings that such are conventionally known alternatives.

The use of the cathode in foil form, the recited cathode "size", voltages, electrolyte composition, and the use of a catalytic recombiner for electrolytically produced gases, are all conventionally known expedients in the art and their use

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in either primary reference would accordingly have been prima facie obvious. It is noted that applicant has not indicated any of these parameters as being critical.

Note the discussion of the Fleischmann et al, von Sturm and Spengler et al references by the Board on pages 14+ of their 11/24/92 decision in SN 07/509585 (Ex parte Dash, 27 USPQ 2d 1481).

13. Claim 4 is rejected under 35 U.S.C. 103 as being unpatentable over either Fleischmann et al or Pavelle et al in view of any of von Sturm, Krause et al, Fedorova et al, Flanagan et al, or Spengler et al as applied to claims 1-9 above and further in view of any of George et al, Edison, or Jensen.

It is conventionally known that the electrolysis system of either primary reference will produce hydrogen and oxygen gases in the space above the heavy water electrolyte. It is also conventionally known to be advantageous in such electrolysis systems to provide a catalyst above the electrolyte for effecting the recombining of the hydrogen and oxygen. It would accordingly have been prima facie obvious to have provided above the electrolyte of either primary reference, a catalyst for effecting the recombination of hydrogen and oxygen as such is a conventional technique in the art.

As evidence thereof, resort may be had to the teachings of any of Jensen, Edison or George et al, for a showing that it is old and advantageous (and hence obvious) to include a catalyst in a closed container for effecting the recombination of hydrogen and oxygen gases (e.g. note the abstracts of Jensen, George et al, and; page 1 lines 29+ and page 2 lines 13+ of Edison).

As set forth by the Board in said 11/24/92 decision, the Edison, Jensen and George et al references all recognized a problem of potential explosion resulting from recombination of oxygen and hydrogen produced during electrolysis. Each of the references added to this rejection disclose the use of catalytic recombination of hydrogen and oxygen (produced at the electrodes during electrolysis) into water.

It would have been prima facie obvious to utilize catalytic conversion of hydrogen and oxygen products of electrolysis (1) to prevent the loss of electrolyte (2) to reduce the risk of explosion from accumulation of an explosive mixture of the gases, and (3) to permit operation in a sealed cell as taught by the references.

14. Claim 6 is rejected under 35 USC 103(a) as being unpatentable over either Fleischmann et al or Pavelle et al in view of any of von Sturm, Spengler et al, Fedorova et al, Flanagan or Krause et al as applied to claims 1-9 above, and further in view of any of Williams et al, Storms et al or Bertalot et al.

While the primary references may not specifically disclose the size of the cathode in terms of area, the secondary references of Storms et al, Williams et al and Bertalot et al each show an electrolytic system similar to that of either primary reference and they each show that the cathode can advantageously be in sheet or strip form and have a size or area of about 1cm^2 and, to so modify either primary reference would accordingly have been prima facie obvious (e.g. see the tables on pages 159+ of Storms et al, the last full paragraph on page 366 of Bertalot et al, and, Table 2 on page 381 of Williams et al).

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15. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Dash et al.

Applicants parent application was held as not meeting the requirements of 35 USC 112 first paragraph. As set forth in MPEP 201.11, the present claims are accordingly not entitled to the filing date of the parent application.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harvey Behrend whose telephone number is (703) 305-1831. The examiner can normally be reached on Tuesday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306-4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 306-4195.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.



HARVEY E. BEHREND
PRIMARY EXAMINER

Behrend/vs
October 25, 2004